DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 5/25/2010, has been entered and made of record.

2. Claims 1-20 are currently pending.

3. Applicants arguments filed 8/25/2010have been fully considered but they are not persuasive.

4. Applicant argues that the identification of near neighbor objects is not equivalent to the identification of a group of objects that are near neighbors in relation to another group of objects. Moreover Applicant argues that none of the reference teaches identifying subspace pattern similarities and that the object in the set exhibit in multi-dimensional spaces; and defining subspace correlations between one of the objects in the set and each of one or more remaining objects in the set based on the identified subspace pattern similarities for use in identifying near-neighbor objects. Additionally, applicant argues that while the process of clustering and " finding the nearest neighbor" share the concept of pattern similarity, the result of the process are not the same ; and once the clustering in completed, however the nearest neighbor of a given data item is still not know.

In response, Examiner disagrees with applicant since when each group of objects represents its own cluster; the distances between those objects are defined by the chosen distance measure. However, once several objects have been linked together, we determine the distances between those new clusters by finding the "nearest neighbors" across clusters to determine the distances between clusters; therefore Wang et al teaches the method by identifying subspace clusters in

high-dimensional data sets, section 1.3 and where the similarity model used in data retrieval and nearest neighbor search is based on value similarity (section 6). Examiner point out section of 1.3 of Wang et al where he identify subspace clusters in high dimensional data sets where he explore subspace clustering which uses pattern similarly to measure the distance between two objects and teaches the PearsonR model [18] that measures the correlation between two objects with respect to all attribute value thus identifying near-neighbor objects and performing effective and accurate similarly matching in non metric spaces. Moreover, Examiner used a secondary reference, Goh et al. , to explain the near neighbor object in large metric spaces wherein two or more data are correlated according to their similarity (see section 3.2, 3.3and 4.1-4.5) . Guh teaches near neighbor identification where two objects that are interchangeable in the representative set do not add useful information for performing cluster ranking. Thus, the set should consist of objects that are non-redundant to one another. A good estimator of redundancy is the correlation between the distance vectors of the objects (section 3.2.4 and figure 5-6 and table 1).

All remaining arguments are reliant on the aforementioned and addressed arguments and thus are considered to be wholly addressed herein.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (Clustering by Pattern Similarity in Large data Sets, ACM SIGMOD' 2002 June 4-6, Madison Wisconsin, USA) in view of Goh et al (DynDex:A dynamic and non-metric space indexer)

As to claim 1, Wang teaches a method for use in finding near-neighbors in a set of objects comprising the steps of: identifying subspace pattern similarities that the objects in the set exhibit in multi-dimensional spaces (identifying subspace clusters in high-dimensional data sets, section 1.3); and defining subspace correlations between in the set and each of or more remaining objects in the set based on the identified subspace pattern similarities for use in identifying near-neighbor objects. Wang discloses clustering by pattern similarity in large data sets (see abstract), including the further limitation wherein the distance function -comprises the following: given two data objects x an d y, a subspace S, and a dimension k € S, the sequence-based distance between x and y is as follows: 7 dist k, S (x, y) =max i € S (xi-yi)- (xk - yk) (see section 4.1: Pair wise Clustering, column 2, lines 1-7; in order to increase the efficiency of determining the pattern similarity) . While Wang meets a number of the limitations of the claimed invention, as pointed out more fully above, Wang fails to specifically teach the defining subspace correlations between one of the objects in the set and each of or more remaining objects in the set based on the identified subspace pattern similarities for use in identifying near-neighbor objects

Specifically, Goh teaches DynDex, an indexing method that deals with both the dynamic and non-metric aspects of the distance function. DynDex employs statistical methods including distance-based classification and bagging to enable efficient indexing with DPF. In addition to its

efficiency for conducting similarity searches in very high dimensional spaces, we show that DynDex remains effective when features are weighted dynamically for supporting personalized searches (Goh abstract). Goh et al. teaches know technique of near neighbor identification where two objects that are interchangeable in the representative set do not add useful information for performing cluster ranking. Thus, the set should consist of objects that are non-redundant to one another. A good estimator of redundancy is the correlation between the distance vectors of the objects (section 3.2.4 and figure 5-6 and table 1) .It would have been obvious to one of ordinary skill in the art to identify the near neighbor object using the subspace correlation in Wang method in order to support fast retrieval speed for high-dimensional data in a non-metric and dynamic space and support efficient similarity searches as well as context based searches via relevance feedback. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claims 2, Goh et al. teaches the method of claim 1, wherein the identifying step further comprises the step of creating a pattern distance index (equation 4 and section 4.1-4.5)

As to claim 3, Wang et al. teaches the method of claim 1, wherein the multi-dimensional spaces comprise arbitrary spaces (figure 1 and 2 and see Goh et al Introduction section 1).

As to claims 4- 5, Wang et al. teaches the method of claim 4, wherein the subspace dimensionality is an indicator of a degree of similarity between the objects (section 4.1; see also Goh et al teaches DPF compares different pairs of objects in different feature subspaces. That is, features are dynamically activated while finding the points of similarity between objects, section 3, paragraphs 1 and 2).

As to claim 6, Goh et al., teaches the method of claim 1, wherein data relating to the objects is static (By applying a static weighting vector for measuring similarity, the weighted Minkowski distance function assumes that similar images resemble the query images in the same set of features, section 2.1).

As to claim 8, Wang et al. teaches the method of claim 1, wherein data relating to the objects comprises gene expression data (the gene expression data are organized as matrices, section 1.2).

As to claims 7 and 9, Wang et al. teaches the method of claim 1, wherein data relating to the objects comprises synthetic data and dynamic data (synthetic and real life data sets, section 5).

As to claim 10, Wang. et al. teaches the method of claim 1, wherein identifying the subspace pattern similarities comprises a comparison of any subset of dimensions in the multi-dimensional spaces (section 2; and Goh et al section 3.2).

. As to claims 11- 13, Wang et al. teaches the method of claim 12, wherein a first pair in the sequence of pairs comprises a base of comparison for one or more remaining pairs in the sequence of pairs (figure 13; see also Goh et al page 470 1st left paragraph).

As to claim 14, Goh teaches the method of claim 12, wherein the sequence of pairs is represented sequentially in a tree structure comprising one or more edges and one or more nodes (coordinate based method , page 469 section 3 paragraph 1).

As to claim 15, Goh et al. teaches the method of claim 2, wherein creating the pattern distance index comprises use of pattern-distance links (section 4.1).

As to claim 16, Goh et al. teaches the method of claim 1, wherein the process is optimized by maintaining a set of embedded ranges (figure 1, page 467)

Claims 17-20 differ from claim 1 only in that claims 19-20 are program claims whereas, claim 1 is an apparatus claim. Thus, claims 19-20 are analyzed as previously discussed with respect to claims above.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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